

COCs	RAO 1			RAO 2			RAO 3			RAO 4			RAO 5			RAO 6			RAO 7			RAO 8		
	Units	Beach ¹¹	Sediment ¹²	Units	Tissue ¹³	Sediment ¹⁴	Units	Surface Water ¹⁵	Units	Groundwater ¹⁶	Units	Sediment ¹⁷	Units	Sediment ¹⁸	Units	Surface Water ¹⁹	Units	Pore Water ²⁰						
Persistent																								
Total PCBs	ug/kg		370	ug/kg	0.3	6	ug/L	0.000064	ug/L	0.5	ug/kg	64 ²¹	ug/kg	31	ug/L	0.014								
Dioxin/Furan (2,3,7,8-TCDD Eq)	ug/kg		0.01	ug/kg	0.000006	0.00003	ug/L	5.1E-10	ug/L	0.00003	ug/kg		ug/kg	0.019	ug/L	0.00038								
Hydrocarbons																								
Total cPAH (BaP Eq)	ug/kg	42	106	ug/kg	0.1	50	ug/L	0.0013																
Total PAH																								
Total LPAH																								
Total HPAH																								
TPH (C-10 to C-12 aliphatic/aromatic)																								
Pesticides																								
Aldrin				ug/kg	0.1	0.6	ug/L	0.000005			ug/kg	40			ug/L	1.5								
Dieldrin				ug/kg	0.1	0.1	ug/L	0.0000053			ug/kg	6.7			ug/L	0.56								
Total DDDx				ug/kg	3	7	ug/L	0.000022*			ug/kg	572			ug/L	0.001*								
gamma-HCH (Lindane)							ug/L	1.7	ug/L	0.2	ug/kg	1.4			ug/L	0.08								
Total Chlordanes				ug/kg	3	1	ug/L	0.000081	ug/L	2	ug/kg	8.9			ug/L	0.0043								
2,4-D							ug/L	100	ug/L	70														
2,4,5-TP (Silvex)							ug/L	10	ug/L	50														
MCPP							ug/L	12																
Metals																								
Arsenic	mg/kg	3	3	mg/kg	0.001	NA	ug/L	2.1 ⁵	ug/L	10	mg/kg	3.5			ug/L	0.38 ^{6,9}								
Cadmium											mg/kg	90			ug/L	11 ^{1,8}	ug/L	NA						
Chromium							ug/L	100	ug/L	100	mg/kg	150			ug/L	3.6 ^{8,9}								
Copper											mg/kg	91	mg/kg	1,900	ug/L	0.54 ^{4,9}								
Lead											mg/kg	315			ug/L	0.012 ⁸								
Manganese							ug/L	320	ug/L	320					ug/L	120								
Mercury	mg/kg		0.03	NA	ug/L	4.3					mg/kg				ug/L	0.012 ⁸								
Vanadium											mg/kg				ug/L	20								
Zinc											mg/kg				ug/L	33 ⁸								
Phthalates							ug/kg	70	NA	ug/L	0.2				ug/L	3								
Butyltins											mg/kg	135			ug/L									
TBT											mg/kg	3.1			ug/L	0.063								
SVOCs																								
1,2-Dichlorobenzene							ug/L	110	ug/L	600					ug/L	763	ug/L	14						
Hexachlorobenzene				ug/kg	0.6	1	ug/L	0.000029	ug/L	1														
Pentachlorophenol							ug/L	0.15	ug/L	1					ug/L	13 ²								
VOCs																								
Benzene											ug/L	74	ug/L	100			ug/L	50	ug/L	130				
Chlorobenzene							ug/L	260	ug/L	80					ug/L	1,240	ug/L	28						
Chloroform											ug/L	2.4												
1,1-Dichloroethane (1,1-DCE)							ug/L	120	ug/L	100														
cis-1,2-Dichloroethylene (c-1,2-DCE)							ug/L	0.24	ug/L	5														
Ethylbenzene							ug/L	1.4	ug/L	5														
Tetrachloroethylene (PCE)							ug/L	200																
Trichloroethylene (TCE)							ug/L	0.023	ug/L	2														
Toluene																								
1,1,1-Trichloroethane (TCA)																								
Vinyl chloride																								
o-Xylene																								
m- and p-Xylene																								
Total Xylene																								
Other							ug/kg	30	NA	ug/L	NA													
PBDE							ug/L	130 ⁶	ug/L	200						ug/L	5.2 ¹⁰	ug/L	5.2					
Cyanide							ug/L	15	ug/L	15														
Perchlorate																								
Toxicity																								
Benthic Toxicity ²¹																								
	Chironomus dilutus 10-day survival: survival > 84% Chironomus dilutus 10-day biomass: biomass > 82% of the laboratory negative control biomass Hyalella azteca 28-day survival: survival > 79% Hyalella azteca 28-day biomass: biomass > 66% of the laboratory negative control biomass																							
	In addition to having survival or biomass values lower than the above PRG percentages, each individual sample with survival or biomass lower than its respective PRGs must have survival or biomass statistically significantly lower than that of the laboratory negative control sediment response, as determined using either a one-tailed parametric t-test, or a one-tailed non-parametric Mann-Whitney U test (sometimes referred to as the Wilcoxon rank sum test or WRS test, either name is fine), with a statistical significance level of $p < 0.05$. Survival/biomass and statistical significance tests must both fail before an individual sample is considered to have exceeded a toxicity based PRG.																							

Footnotes:

- 1 This value is for Total Arsenic.
 2 This value is for Chromium VI.
 3 Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: $CMC = \exp(1.005(\text{pH}) - 4.869)$; $CCC = \exp(1.005(\text{pH}) - 5.134)$. Value based on pH=7.8.
 4 This value is for the sum of 2,4' and 4,4' isomers of either DDE or DDT: 0.000031 ug/L is the value for the sum of 2,4' and 4,4' DDD isomer.
 5 The arsenic criteria are expressed as total inorganic arsenic. The "water + organism" criterion is based on a risk level of 1×10^{-6} .
 6 The cyanide criterion is expressed as total cyanide (CN) L.
 7 This value is for DOT.
 8 This value is for the dissolved fraction.
 9 This is a hardness dependent metal. All values were calculated based on 25 mg/l of CaCO₃.
 10 Expressed as free cyanide.
 11 Values in this column are evaluated point-by-point on any beach.
 12 Values in this column are evaluated in river by rolling 1/2-RM average by side of river in sediment.
 13 Values in this column are evaluated by rolling 1-RM average by side of river in individual fish (fillet).
 14 Values in this column are evaluated by rolling 1-RM average for each RM segment (East nearshore, Navigation Channel, West nearshore) in sediment.
 15 Values in this column are evaluated point-by-point in pore water or surface water.
 16 Values in this column are evaluated point-by-point in pore water or ground water.
 17 Values in this column are evaluated point-by-point in sediment, unless otherwise noted.
 18 This value is evaluated by rolling 1-RM average for each RM segment (East nearshore, Navigation Channel, West nearshore) in sediment.
 19 Total DDX and lead in this column are evaluated by rolling 1-RM average in sediment. Total PCBs in this column are evaluated by rolling 2-RM average in sediment. 2,3,4,7,8-PeCDF is evaluated by rolling 1-RM average by side of river in sediment.
 20 Values in this column are evaluated point-by-point in pore water.
 21 This values is evaluated point-by-point in sediment.
 22 Anthracene = 0.73 ug/L; Benzo(a)anthracene = 0.027 ug/L; Benzo(a)pyrene = 0.014 ug/L; 2-methylnaphthalene = 2.1 ug/L; Naphthalene = 12 ug/L.
 NA Value not available.

COCs	Units	Background	
Persistent		95% UCL	95% UPL
Total PCBs	ug/kg	4	8
Total PCDD/Fs	ug/kg	0.08	0.2
Hydrocarbons			
cPAH	ug/kg	8	20
Total PAH	mg/kg	0.07	0.2
Total LPAH	mg/kg	0.01	0.02
Total HPAH	mg/kg - %fines	NA	NA
TPH (C-10 to C-12 aliphatic/aromatic)	mg/kg	NA	NA
Pesticides			
Aldrin	ug/kg	ND	ND
Dieldrin	ug/kg	ND	ND
Total DDX	ug/kg	2	3
gamma-BHC (Lindane)	ug/kg	ND	ND
Total Chlordanes	ug/kg	0.4	0.7
Metals			
Arsenic	mg/kg	3	4
Cadmium	mg/kg	0.1	0.2
Chromium	mg/kg	24	32
Copper	mg/kg	26	37
Lead	mg/kg	11	15
Mercury	mg/kg	0.034	0.052
Zinc	mg/kg	77	104
Phthalates			
BEHP	ug/kg	40	103
Butyltins			
TBT	mg/kg	ND	ND
Other			
PBDE	ug/kg	ND	ND
Toxicity			
Benthic Toxicity		NA	NA

OC Correction Factor = 1.5

Background - OC Corrected	
95% UCL	95% UPL
6	12
0.12	0.3
<hr/>	
12	30
0.11	0.3
0.02	0.03
NA	NA
NA	NA
<hr/>	
ND	ND
ND	ND
3	5
ND	ND
0.6	1
<hr/>	
3	4
0.1	0.2
24	32
26	37
11	15
0.034	0.052
77	104
<hr/>	
60	155
<hr/>	
ND	ND
<hr/>	
ND	ND
<hr/>	
NA	NA

COCs	RAO 1		RAO 2		RAO 3	RAO 4	RAO 5
	Beach	Sediment	Tissue	Sediment	Surface Water	Groundwater	Sediment
Persistent							
Total PCBs	--	R	R	B	A1	A2	R
Dioxin/Furan (2,3,7,8-TCDD Eq)	--	R	R	R	A1	A2	--
Hydrocarbons							
Total cPAH (BaP Eq)	R	R	R	R	--	--	--
Total PAH	--	--	--	--	--	--	R
Total LPAH	--	--	--	--	--	--	R
Total HPAH	--	--	--	--	--	--	R
TPH (C-10 to C-12 aliphatic/aromatic)	--	--	--	--	---	---	R
Pesticides							
Aldrin	--	--	R	R	A1	--	R
Dieldrin	--	--	R	R	A1	--	R
Total DDX	--	--	R	R	A1	--	R
gamma-HCH (Lindane)	--	--	--	--	A1	A2	R
Total Chlordanes	--	--	R	R	A1	A2	R
2,4-D	--	--	--	--	A1	A2	--
2,4,5-TP (Silvex)	--	--	--	--	A1	A2	--
MCPP	--	--	--	--	R2	--	--
Metals							
Arsenic	B	B	R	--	A1	A2	--
Cadmium	--	--	--	--	--	--	R
Chromium	--	--	--	--	A2	A2	R
Copper	--	--	--	--	--	--	R
Lead	--	--	--	--	--	--	R
Manganese	--	--	--	--	R2	R2	--
Mercury	--	--	R	--	R2	--	--
Vanadium	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	R
Phthalates							
BEHP	--	--	R	--	A1	--	R
Butyltins							
TBT	--	--	--	--	--	--	R

SVOCs							
1,2-Dichlorobenzene	--	--	--	--	A1	A2	--
Hexachlorobenzene	--	--	R	R	A1	A2	--
Pentachlorophenol	--	--	--	--	A1	A2	--
VOCs							
Benzene	--	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	A1	A2	--
Chloroform	--	--	--	--	A1	A2	--
1,1-Dichloroethane (1,1-DCE)	--	--	--	--	--	R2	--
cis-1,2-Dichloroethylene (c-1,2-DCE)	--	--	--	--	--	--	--
trans-1,2-Dichloroethylene (t-1,2-DCE)	--	--	--	--	A1	A2	--
Ethylbenzene	--	--	--	--	--	--	--
Tetrachloroethylene (PCE)	--	--	--	--	A1	A2	--
Trichloroethylene (TCE)	--	--	--	--	A1	A2	--
Toluene	--	--	--	--	--	--	--
1,1,1-Trichloroethane (TCA)	--	--	--	--	--	A2	--
Vinyl chloride	--	--	--	--	A1	A2	--
o-Xylene	--	--	--	--	--	--	--
m- and p-Xylene	--	--	--	--	--	--	--
Total Xylene	--	--	--	--	--	--	--
Other							
PBDE	--	--	R	--	--	--	--
Cyanide	--	--	--	--	A1	A2	--
Perchlorate	--	--	--	--	A2	A2	--
Toxicity							
Benthic Toxicity	--	--	--	--	--	--	R

- R Risk-based threshold
R2 Regional Screening Level for Tap Water (Nov 2013)
Suter II, G.W. and Tsao, C.L., 1996. Toxicological Benchmarks for Screening Potency on Aquatic Biota: 1996 Revision. ORNL publication ES/ER/TM-96/R2
R3 Background
A1 ARAR - Based on Oregon WQS Table 40 (organism + water)
A2 ARAR- MCL (Nov 2013)

- A3 ARAR - Based on Oregon WQS Tables 20, 33A and 33B (chronic) - Feb 7, 2013
- A4 ARAR - Based on Oregon WQS Table 33C
- A5 ARAR - National Water Qualtiy Criteria for Aquatic Life

RAO 6	RAO 7	RAO 8
Sediment	Surface Water	Pore Water
R	A3	--
R	A4	--
--	--	--
--	--	R3
--	--	--
--	--	--
--	--	--
--	A5	--
--	A3	--
--	A5	--
--	A3	--
--	A3	--
--	--	--
--	--	--
--	--	--
--	--	--
--	A3	--
--	A3	--
--	A3	--
R	A3	--
--	--	R
--	A3	--
--	--	R
--	A3	--
--	A4	--
--	A3	--

--	A4	R3
--	--	--
--	A3	--
--	--	R
--	A4	R3
--	A4	R3
--	--	R
--	A4	R3
--	A4	R3
--	--	R
--	--	R3
--	--	--
--	--	R3
--	--	R3
--	--	R
--	--	--
--	A3	R
--	--	R
--	--	--

Potential Contaminants of Concern for Effects